

## **Response**

### Rejection of Claim 9 under 35 USC §112: (Paragraph 1 of the First Office Action)

The examiner presently rejects claim 9 as having a range within a range. Claim 9 has  
5 been amended to meet the examiner's requirement. Claim 12 has been modified to more accurately claim the invention.

### Rejection of Claims 1-11, 16 and 17 under 35 USC §102: (Paragraphs 2 and 3 of the First Office Action)

10 The examiner states that US Patent No. 1,462,804 ("Evans" in the First Office Action, "The '804 patent " herein) anticipates the present invention.

Applicant notes potential pictorial resemblance of the '804 patent to the present invention. Both sets of diagrams could be taken to show a chaffer having a cross-sectional view which is a jagged series of valleys and peaks. This further might apply to the second reference  
15 relied upon by the examiner, EP No. 0312655 to Desnijder ("The '655 patent" herein), and several patents made of record but not yet cited by the examiner in this case.

However, applicant very respectfully points out that the exact wording of claim 1 of the present invention is what is at issue, not any casual resemblances. The applicant very respectfully restates the operative language of claim 1, with certain points underlined for later  
20 reference in this present Response and Amendment:

“...the chaffer comprising: a plurality of air jets dimensioned and

configured to provide an air blast; and a plurality of screens  
positioned between the air jets, at least one of the screens having a  
plurality of apertures dimensioned and configured to admit such  
crop, the plurality of apertures having a minimal flow of air  
5 therethrough.”

Thus the present invention teaches two different types of structures: air jets and screen  
apertures. This is not just a distinction in the claim language but is a structural difference in  
engineering practice in two unrelated technologies, and further as shown and defined in the  
10 present application. By definition in the claim and specification, an air jet has a substantial flow  
therethrough while apertures have a minimal flow of air therethrough. Screen apertures are  
dimensioned and configured to admit grain therethrough, and substantial air flow therethrough  
would reduce the efficiency of the present invention.

The specification points out the difference between an air jet and an aperture in a number  
15 of places. Beginning with the diagrams, Figures 6 and 7 in particular show in most detail the  
differences, structural and conceptual, between an air jet and a screen aperture. The numerous  
hexal holes of screen 18 and the air jet 22 are very different. (All other diagrams show this  
difference as well.)

Turning from the diagrams to quote from the originally filed specification, page 22, lines  
20 17 et seq:

As used herein, the word “jet” is used to mean more than a simple

gap or louvered opening. Louvers, as commonly used in the prior art, are parallel plates which simply redirect an air flow through the gap between without otherwise altering it. A “jet” as used herein, however, utilizes both the forced draft from a fan (such as fan 44) and also the pressure difference between inlet and outlet to generate an air blast which is more powerful (in the path of the blast downstream) than the air flow into the jet on the upstream side. Reference to Fig. 6 shows that the area of riser 20 is substantially greater than the area of air jet 22. This assists air jet 22 in developing a more powerful air blast. In addition, in the embodiment pictured, air jet 22 narrows from base to outlet, thus causing an increase in air velocity from the nozzle.

It is elementary fluid dynamics that compressible fluids (i.e. gases such as air) move at a speed proportional to the area of the opening through which they pass, this is known as the Venturi effect, Bernoulli Principle and presumably by various other terms. This principle is utilized in wind tunnels and air nozzles to induce a higher speed of airflow at the constriction. This principle is borrowed by the inventor from the field of aerodynamics and is used herein: as stated in the above passage of the application, the airflow is constricted as it passes through the jet (the area of riser 20 is substantially greater than the area of air jet 22, and the air jet narrows from base to inlet) and an increased speed and cohesiveness of airflow results. Similarly, an air jet may be induced by a pressure differential below and above the screen, by the direction of the

air flow (parallel to the blast generated by the fan located lower down and forward of the chaffer in the combine harvester body), and by other effects. This is the ordinary understanding of the term “air jet”, even without the definitional statements of the present disclosure.

The purpose of these structural differences is as follows. The present invention directs an  
5 air blast above the upper surface of the screens and parallel to them, thus greatly aiding the cleaning/chaffing of the grain. As stated in the original application at page 18, lines 8 through  
10:

Air jet 22 is located at a distance from the joint of screen 18 and riser 20,  
whereby the air blast parallel to screen 18 is displaced from screen 18 by the same  
10 distance.

This flow above and across the screen cannot be produced by the ‘804 patent: the air flow will be weaker than the blast of the present invention, comes in an unfocused flow through a large number of holes, and will be strongest simply at the top side of the screen rather than  
15 focused above it as in the present invention. The system of the ‘804 patent will not work in a comparable manner to the present invention as there will be too much back pressure and as stated in the ‘804 patent at line 95, “...the air will pass through the body and the extension portion in a direction substantially perpendicular to their surfaces...” Even more importantly, at line 110 of the ‘804 the statement is made that “... the various sources of air against one another will  
20 effectively destroy any eddies that may form...” Of course, the air blast of the present invention is an eddy harnessed to increase efficiency of the device.

An air jet is not in any sense a simple aperture.

And on the other hand, the air jets of the invention do not fulfill the conceptual and structural requirements of a screen aperture. The screen apertures of the present invention, and various apertures, gaps and louvers of the references cited, are all sized to permit passage of grain therethrough. Apertures 17 and 17' of the '804 patent work in a manner vaguely similar to the  
5 hexel holes of screen 18 of the present invention. Apertures 17 and 17' both appear to be merely grain screen holes, the only difference being their orientation either on the screen or on the riser (substantially horizontal or substantially vertical). As stated herein and in the original application, an air jet is not just an aperture oriented in a different direction. In addition, the '804 patent specifies that air rises out of these apertures, while the present invention seeks to minimize  
10 airflow through the apertures in order to increase efficiency of the system, and this limitation is stated in claim 1 of the present invention. The air jets of the preferred embodiment of the present invention have an airblast too powerful to allow passage of grain therethrough. In fact, the airjets of the present invention's commercially very successful preferred embodiment are dimensionally too small to allow grain to pass therethrough. Thus, not only is an aperture structurally dissimilar  
15 to and functionally unable to function as an airjet but the converse is also true: an airjet as commonly defined and specifically defined in the invention is structurally dissimilar to and unable to function as an grain passing aperture.

Rejection of Claims 12-15 under 35 USC §102: (Paragraph 4 of the First Office Action)

20 The examiner further rejects claims 12-15 on the basis of European Patent No. 0312655, (hereinafter the '655 patent) but the two inventions are drawn to different concepts and purposes, with the result that they have numerous structural differences. In general, the '655 patent

teaches a number (5) elongated elements which have freedom in the roll dimension (meaning they may pivot about a longitudinal axis) so as to compensate for "sidehill" harvesting conditions in which the combine is traversing a hill sideways. This freedom of motion is present whenever the device is in use. The present invention on the other hand only allows non-use-time removal of individual elongated elements by means of rotation in the pitch dimension (meaning they may pivot about a lateral axis), and this removal is only allowed when the various retention mechanisms (alignment notches, spring urging rotation away from the seated position) are properly disengaged. Thus, structurally, the present invention has a lateral hinge pivot, while the '655 patent has longitudinal "fore-and-aft extending pivot pins 101" ('655 patent, column 12, lines 36, 37). The present invention allows individual removal of the chaffing elements from the frame as stated at page 17, lines 16-18 of the original application, "Instead, individual ones of a plurality of coterminously positioned removable chaffing elements (such as element 14) are changed, a much easier task" while the frame of the '655 patent "is removably mounted as a unit" ('655 patent, column 12, line 14). Claim 12 of the present invention has been modified to import this word "individually" from the cited line of the specification, thus more clearly defining the invention.

Numerous other structural differences between the invention and the device of the '655 patent exist, simply due to the basic conceptual difference between the inventions: one deals with a sidehill harvesting condition while the other deals with easy removal of the elements. But the applicant respectfully urges that the cited difference ("individually removable") is by itself sufficient for patentability over the '655 reference.

For all the foregoing reasons, applicant respectfully urges that the claims of the application are now in condition for immediate allowance, and such action is requested. The examiner is respectfully urged to contact applicant's counsel, Craig W. Barber, PO Box 16220, Golden, Colorado, 80402-6004, 303-278-9973, fax 303-278-9977, with any questions or  
5 comments.

Signed: 

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